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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/054,706	01/24/2002	Farrokh Alemi	GMU-22U	5413
28598	7590	08/08/2006	EXAMINER	
GEORGE MASON UNIVERSITY OFFICE OF TECHNOLOGY TRANSFER, MSN 5G5 4400 UNIVERSITY DRIVE FAIRFAX, VA 22030			GOTTSCHALK, MARTIN A	
			ART UNIT	PAPER NUMBER
			3626	

DATE MAILED: 08/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/054,706

Applicant(s)

ALEMI ET AL.

Examiner

Martin A. Gottschalk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Notice to Applicant***

1. Claims 1-8 have been examined.

### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

- A. In the present case, the abstract exceeds 150 words. Correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 6 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

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described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In the current case, the details of the probability calculation - the recited probability denominator comprising a "plus one" component in particular - are not described in enough detail to enable one of ordinary skill in the art to understand and apply it. On review of the specification, the Examiner notes that the probability calculation formula is recited in paragraphs [0014] and [0038], but that no supporting detail is available.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seare et al (US Pat# 5,557,514, hereinafter Seare) in view of Ziegele (PG Pub# US

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2005/0125257, hereinafter Ziegele), and further in view of Lockwood (US Pat# 5,706,441, hereinafter Lockwood).

A. As per claim 1, Seare discloses an episode classification system including:

a. a multitude of diagnosis records (Seare: col 21, lns 10-19), each of said diagnosis records including:

i. diagnoses information (Seare: col 22, lns 14-27, e.g. "claim ID" );

ii. time of diagnoses information (Seare: col 22, lns 14-27, e.g. "claim ID");

and

iii. patient information (Seare: col 22, lns 14-27);

b. a patient grouper for generating at least one patient group, each patient group generated by grouping patient records having similar patient information (Seare: Seare: col 24, lns 18-21, i.e. sorting by "index code");

c. a diagnosis grouper for generating at least one diagnosis group from a patient group, each diagnosis group generated by grouping patient records from a

patient group that have similar diagnosis information (Seare: col 24, lns 21-26, i.e. sorting on "qualifying ICD codes");

d. an episode analyzer including:

ii. a episode grouper for grouping diagnosis records determined to belong to a single episode (Seare: Figs 2-5, and 12; col 23, section titled "Determination of Episode of Care").

Seare fails to disclose item d-i, however this feature is disclosed by Ziegele, who teaches

i. a probability analyzer for performing probability calculations, each of said probability calculations capable of generating a probability value using at least two of said multitude of diagnosis records as input entries, said probability value representing the probability that said input entries belong to a single episode (Ziegele: Fig 1; [0014] - [0016]);

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Ziegele into the system of Seare with the motivation of maintaining updated relationships between diagnostic information records and actual and potential treatment modalities relevant to the diagnosis (Ziegele: [0010]).

Seare further fails to disclose item d-iii, however this feature is disclosed by Lockwood, who teaches

iii. a severity analyzer for performing episode severity calculations, each of said episode severity calculations capable of generating an episode severity value (Lockwood: col 4, lns 46-61).

It would have been obvious at the time of the invention to one of ordinary skill in the art to incorporate the teachings of Lockwood into the system taught by Seare with the motivation of accurately differentiating levels of case complexity handled by different categories of healthcare providers (Lockwood: col 3, lns 43-53).

In subsequent claims combining the teachings of Seare, Lockwood, and Ziegele, the same motivation is applied as above, will not be repeated, and is incorporated therein.

B. As per claims 2-4, Seare discloses an episode classification system according to claim 1 wherein at least one of said diagnosis records is

(claim 2) an anchor diagnosis record (Seare: col 22, lns 49-52, reads on "date of service from");

(claim 3) a trigger diagnosis record (Seare col 8, ln 50 to col 9, ln 47, note the triggering effect of the Index table which the Examiner considers to be a type of trigger diagnosis record);

(claim 4) stopping point diagnosis record (Seare: col 22, lns 49-52, reads on "date of service to").

C. As per claim 5, episode classification system according to claim 1 wherein said calculation:

b. is a function of:

i. a similarity value, said similarity value representing the similarity between said pair of diagnostic records (Seare: e.g. an index code represents a similarity value, col 7, lns 35-64);

and



- ii. a time between diagnosis value, said time between diagnosis value representing the time between said pair of diagnostic records (Seare: col 24, ln 60 to col 25 ln 26).

Seare discloses operating on one or more records but fails to disclose operating specifically on a pair of records. However this feature is well known in the art as evidenced by the teachings of Ziegele who teaches a probability calculation which

- a. operates on a pair of diagnosis records (Ziegele: [0079]-[0080]).

D. As per claim 6, Seare teaches the similarity value as per the previous claim, but fails to explicitly disclose the rest of the claim, however these features are taught by Ziegele who teaches the episode classification system according to claim 5 wherein said probability calculation includes

a probability numerator divided by a probability denominator said probability numerator set to said similarity value times a first constant and said probability denominator set to the quantity of a second constant times said time between diagnosis value plus one (Ziegele: [0032], i.e. the constants both equal 1. The Examiner notes that probability calculation is old and, applying a variety of well-developed equations.).

E. As per claim 7, Seare discloses a method for episode classification using a multitude of diagnosis records (Seare: col 21, Ins 10-19), each of said multitude of diagnosis records including: diagnosis information; time of diagnoses information; and patient information (Seare: col 22, Ins 8-27); including the steps of:

- a. creating at least one diagnosis pair from said multitude of diagnosis records, each said diagnosis pair containing a unique combination of two diagnoses information (Seare: col 24, Ins 18-21, i.e. index codes contain at least one pair of diagnoses information.);

- b. for each said diagnosis pair, iteratively:

- i. determining a co-occurrence value, said co-occurrence value being the number of unique patients for whom the two diagnoses contained in each of said diagnosis pairs occurred within a co-occurrence window;

and

- ii. associating said co-occurrence value with each diagnosis information contained in said diagnosis pair (Seare: col 27, Ins 15-27);

c. creating at least one patient group, each said patient group generated by grouping said diagnosis records having similar said patient information (Seare: col 24, lns 21-26, i.e. sorting patients by “qualifying ICD code” produces a patient group.);

and

d. for each said patient group, iteratively:

i. creating at least one diagnosis group, each said diagnosis group generated by grouping said diagnosis records having similar said diagnosis information (Seare: col 24, lns 26-33, i.e., patients grouped by undertaking “procedures related to a specific medical condition”);

ii. for each said diagnosis group, iteratively adding a unique occurrence identifier to said diagnosis information for each said diagnosis record (Seare: col 24, lns 38-45, reads on “staging indicator”);

iii. creating at least one time between diagnosis pair from said diagnosis records in said diagnosis group, each said time between diagnosis pair containing a unique combination of two said diagnosis records (Seare: col 24, lns 60-66, time between diagnosis reads on “clear window”);

iv. for each said time between diagnosis pair, iteratively:

1. setting a time between diagnosis pair value for each said diagnosis pair equal to the absolute value of the difference between said time of diagnoses information from each said diagnosis record in said diagnosis group (Seare: col 24, ln 60 to col 25, ln 26);

2. setting a score numerator equal to said co-occurrence value having the same combination of diagnosis information as said time between diagnosis pair value (Seare: col 27, lns 15-27, reads on "adjustment factor");

3. calculating a score for said diagnosis pair by dividing said score numerator by said time between diagnosis pair value (The Examiner notes that the arithmetic process of division is well known);

and

4. associating said score to said diagnosis pair (Seare: col 27, lns 15-27);

v. setting a minimum score value equal to the minimum said score from the set of said scores associated to each of said diagnosis pairs in said patient group;

vi. setting a maximum score value equal to the maximum said score from the set of said scores associated to each of said diagnosis pairs in said patient group;

vii. setting a difference score value equal to difference of said maximum score value and said minimum score value (for steps v-vii, see Seare: col 27, ln 44 to col 28, ln 3, i.e. maximum and minimum scores provide the limits of the recited "defined statistical criteria"; difference reads on "variance");

viii. for each said diagnosis pair, iteratively:

1. setting a standardized score numerator value equal to said minimum score minus said score associated to said time between diagnosis pair;

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2. setting a standardized score equal to said standardized score numerator divided by said difference score value; and

3. associating said standardized score to said diagnosis pair (for steps viii 1-3, the Examiner notes that the statistical procedure of standardizing scores is well known. Also see Seare: col 6, ln 15 which identifies CPT codes as "standard," and note that the CPT and codes drive the scoring system of the reference invention.);

and

ix. classifying each said diagnosis information into at least one episode using said standardized score (Seare: col 25, lns 38-43).

F. As per claim 8, Seare discloses a method according to claim 7 wherein said step of classifying each said diagnosis information into at least one episode includes the steps of:

a. flagging each of said diagnosis information in said patient group for analysis (Seare: col 22, lns 10-12);

and

- b. until all diagnosis information in said patient group is analyzed, iteratively:
  - i. combining two of said diagnosis information in said patient group flagged for analysis which have the maximum said standardized scores not exceeding a preset cutoff into an episode record (Seare: col 25, lns 29 - 62);
  - ii. creating a new diagnosis information, said new diagnosis information representing said diagnosis information in said episode record;
  - iii. calculating a new standardized score for said new diagnosis information by averaging the standardized score associated with each of said diagnosis information in said episode record (for steps b ii-iii, see Seare: col 25, ln 65 to col 26, ln 6);
- and
- iv. de-flagging said diagnosis information in said episode record for further analysis (Seare: col 26, 12-13).

***Conclusion***


8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited but not applied prior art discloses a plurality of systems for analyzing healthcare utilization from medical records or insurance claims data.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin A. Gottschalk whose telephone number is (571) 272-7030. The examiner can normally be reached on Mon - Thurs 8:30 -6 and alternate Fri 8:30 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Thomas can be reached on (571) 272-6776. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MG



JOSEPH THOMAS  
SUPERVISORY PATENT EXAMINER



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